

AMENDMENTS AND REMARKS

Claim Amendments

Claims 1 and 13 have been amended by the deletion without prejudice of Formulae (I) to (III). Instead the non-polymeric hydrocarbyl substituted dicarbonyl derivative is defined to specify:

“wherein the non-polymeric hydrocarbyl substituted dicarbonyl derivative is selected from a non-polymeric hydrocarbyl substituted dicarbonyl derivative of tartaric acid, muccic acid, citramalic acid, citric acid, isopropylmalic acid, gluconic acid, malic acid, oxalic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, 1,11-undecanedicarboxylic acid, 1,12-dodecanedicarboxylic acid and mixtures thereof, and wherein the hydrocarbyl contains about 4 to about 80 carbon atoms;”

The non-polymeric hydrocarbyl substituted dicarbonyl derivative is defined in such a way that the acids named in the Markush group are all hydrocarbyl substituted. Support for the named acids is located in original claim 6, and on page 12, lines 11 to 15 specifying:

“Alternatively, the non-polymeric hydrocarbyl substituted dicarbonyl derivative is often selected from the group consisting of tartaric acid, citric acid, tartaric acid, muccic acid, citramalic acid, citric acid, isopropylmalic acid, gluconic acid, malic acid, oxalic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, 1,11-undecanedicarboxylic acid, 1,12-dodecanedicarboxylic acid and mixtures thereof”.

Claims 1 and 13 have deleted without prejudice the copolymer derived from monomers comprising (1) an olefin; and (2) an unsaturated dicarboxylic acid anhydride or derivatives thereof.

Claims 16 to 18 are new.

Claim 16 specifies:

“The composition of claim 1, wherein the non-polymeric hydrocarbyl substituted dicarbonyl derivative is a derivative of succinic acid, and wherein the hydrocarbyl contains about 4 to about 80 carbon atoms.”

Claim 17 specifies:

“The composition of claim 1, wherein the hydrocarbyl contains about 6 to about 20 carbon atoms.”

Support for the number of carbons present on the hydrocarbyl as defined in claims 1, 16 and 17 is found in the specification on page 9, lines 15-17 stating: “Preferably T is a hydrocarbyl group often containing about 4 to about 80, preferably 4 to about 40, more preferably about 6 to about 30, even more preferably about 6 to about 20 and most preferably about 8 to about 20 carbon atoms.”

In particular claims 1 and 16 specify about 4 to about 80 carbon atoms, and claim 17 specifies about 6 to about 20 carbon atoms. A person skilled in the art would instantly recognise that the description of the hydrocarbyl term as defined by the formulae (I) to (III) also relates to the same species defined by claims 5 and 6 because the number of carbon atoms correlates with, for instance the preferred number of carbon atoms defined on page 9, lines 26 to 28. In particular said text specifies:

“Preferably T is selected from the group consisting of nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, octadecenyl, nonodecyl and mixtures thereof.”

The same number of carbon atoms is preferably taught for the acids described in original claims 5 and 6.

In view of the amendments discussed above, claim 6 to 8 and 11 have been deleted without prejudice.

CLAIM REJECTIONS

The Examiner has rejected claim 12 under 35 U.S.C. 112, second paragraph to claims 5 and 6 because the Examiner is unclear how a succinic acid or azelaic acid can be a derivative of a compound of claim 1. In view of the amendment discussed above replacing the formulae with text, the Applicant submits that the rejections to claims 5 and 6 are obviated. The Examiner is respectfully requested to withdraw the claim rejections to claims 5 and 6.

CLAIM OBJECTIONS

The Examiner has objected to claims 1 and 13 because the definition of T states or mixtures thereof. In view of the amendment discussed above, The Applicant submits

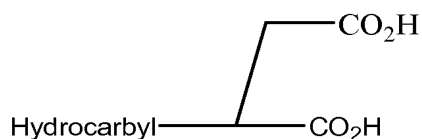
that the objections to claims 1 and 13 are obviated. The Examiner is respectfully requested to withdraw the claim objections to claims 1 and 13.

REMARKS

The Examiner has rejected claims 1-4, 6 and 9 under 35 U.S.C. 102(b) in view of Olson (US 5,308,514).

The Examiner contends that Olson discloses a grease composition comprising an overbased calcium sulphonate containing solid particles of colloiddally dispersed calcium carbonate in the form of calcite. Olson further discloses the grease composition containing a lubricating oil and a salt forming acid. Acids such as orthophosphoric acid, overlap with the definition of the inorganic acid of the present invention. Further Olson discloses organic acids such as malonic acid or succinic acid (column 4, lines 20-26).

Applicants submit that the amendment to claims 1 and 13 obviate the Examiner's 102(b) rejection because the non-polymeric hydrocarbyl substituted dicarbonyl derivative is defined in such a way that the named acids all contain a hydrocarbyl group with about 4 to about 80 carbon atoms. As an example, a hydrocarbyl substituted dicarbonyl derivative of succinic acid could be represented by



wherein the hydrocarbyl group contains about 4 to about 80 carbon atoms. As defined in claims 1 and 13 the acid groups shown above may be in the form of an acid, an ester, a salt, an anhydride, ester-acid, acid-salt and mixtures thereof. Example 1 as disclosed in the specification clearly demonstrates compounds of this type because dodecenyl succinic acid is used.

Similar structures could be drawn for other acids listed in the Markush language for element (1) of claims 1 and 13.

In contrast, succinic acid as disclosed by Olson does not contain a hydrocarbyl group. The succinic acid defined by Olson has a chemical structure of $\text{HO}_2\text{C}-\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$. Accordingly, Applicants submit that the present invention is novel over Olson. The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) in view of Olson.

Applicants submit that all pending claims (claims 1, 5, 10, 12-14, 16 to 17) are unobvious over Olson (including claims 13-14 explicitly rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Olson) in view of the technical differences highlighted above. In particular, Olson does not teach, suggest or otherwise disclose the non-polymeric hydrocarbyl substituted dicarbonyl derivative as presently claimed as being suitable for a grease composition to provide the performance as defined within Applicant's specification. Accordingly, the Applicant requests the Examiner finds that all pending claims meet the requirements of 35 U.S.C. 103(a) i.e., all of the present claims are unobvious over Olson.

The Examiner has further rejected claims 7, 8, and 11 under 35 U.S.C. 103(a) in view of Olson and Ney (US 5,932,525).

The Examiner further rejected claim 1 under 35 U.S.C. 103(a) as being unpatentable over Benda (US 5,830,832) in view of Cain (US 2003/0000866 A1).

The rejections raised by the Examiner in relation to (i) Olson and Ney; and (ii) Benda and Cain are obviated because the disclosures referred to in Benda and Ney disclose polymeric materials. In view of the amendment discussed above, the present invention specifies non-polymeric hydrocarbyl substituted dicarbonyl derivatives as defined by claims 1 and 13. Accordingly, the materials disclosed by Ney and Benda do not reflect the materials presently claimed because they are not non-polymeric hydrocarbyl substituted dicarbonyl derivatives. Further, since neither Olson (see discussion on Olson above), Benda nor Cain, teach, suggest, or otherwise disclose the non-polymeric hydrocarbyl substituted dicarbonyl derivatives of the present invention, a person skilled in the art would not have the expectation that such materials would be appropriate to fulfill the objective of the present invention. Accordingly, the present invention is unobvious over (i) Olson and Ney; and (ii) Benda and Cain. The Examiner is respectfully request to withdraw the rejections based on these disclosures.

The Examiner has further rejected claim 12 under 35 U.S.C. 103(a) in view of Olson, Muir and Ney. Applicants submit that the present invention is unobvious in view of remarks above relating to Olson in view of claims 1 and 13. In particular since Olson does not disclose, teach, or suggest the non-polymeric hydrocarbyl substituted dicarbonyl derivatives as presently claimed, a person skilled in the art would not arrive

at claim 12 of the present invention by combining the disclosures of Olson, Muir and Ney.

The Examiner has further rejected claim 5 under 35 U.S.C. 103(a) in view of Olson and Hayashi.

The Examiner contends that Olson does not disclose succinic acid as being substituted with a hydrocarbyl group. However, Hayashi discloses a grease composition comprised of hydrocarbyl substituted succinic acid (column 17, line 55 to column 18, line 3, also column 22, lines 10-24, column 22, line 68 to column 23, line 5).

Hayashi discloses a lubricating composition containing an oil soluble reaction product of an acylated reaction product, a polyamine and a mono-functional acid. The oil soluble reaction product is suitable for improving viscosity and dispersancy of lubricating oils. Thus a person skilled in the art would contemplate employing in a lubricating oil a compound capable of improving viscosity and dispersancy.

Applicants submit that the product of Hayashi contains either imide or amide groups because of the reaction with the polyamine. In contrast, the non-polymeric hydrocarbyl substituted dicarbonyl derivative selected from the group consisting of an acid, an ester, a salt, an anhydride, ester-acid, acid-salt and mixtures thereof, wherein the non-polymeric hydrocarbyl substituted dicarbonyl derivative is selected from a non-polymeric hydrocarbyl substituted dicarbonyl derivative of tartaric acid, muccic acid, citramalic acid, citric acid, isopropylmalic acid, gluconic acid, malic acid, oxalic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, 1,11-undecanedicarboxylic acid, 1,12-dodecanedicarboxylic acid and mixtures thereof, and wherein the hydrocarbyl contains about 4 to about 80 carbon atoms. Accordingly, the non-polymeric hydrocarbyl substituted dicarbonyl derivative of the present invention does not contain imide or amide functional groups are formed by Hayashi. The derivatives of the present invention are defined as being an ester, a salt, an anhydride, ester-acid, acid-salt and mixtures thereof.

Further, in view of the discussion above relating to Olson, the Applicants submit that since Olson does not disclose, teach, or suggest the non-polymeric hydrocarbyl substituted dicarbonyl derivatives as presently claimed.

In view of the discussion above relating to Olson, even if a person skilled in the art were to combine the disclosures of Olson and Hayashi, the end combination would

always contain a composition with a compound of Hayashi that contains an amide or imide functional group. In contrast, the non-polymeric hydrocarbyl substituted dicarbonyl derivative of the present invention does not contain imide or amide on the non-polymeric hydrocarbyl substituted dicarbonyl derivative. Accordingly, a person skilled in the art would not derive the present invention from Olson and Hayashi. The Applicant respectfully requests the Examiner to withdraw the 35 U.S.C. 103(a) in view of Olson and Hayashi.

The Examiner has rejected claims 1, 5, 10, 12, 13, and 14 under 35 U.S.C. 103(a) as being unpatentable over Olson in view of Muir, Ney, and Hayashi. Applicants respectfully traverse.

In view of the discussion above relating to all of the references cited in this rejection, the combination of all of these disclosures would not arrive at the present invention because Olson does not disclose, teach, or suggest the non-polymeric hydrocarbyl substituted dicarbonyl derivatives as presently claimed. Accordingly, the Applicant submits that claims 1, 5, 10, 12, 13, and 14 of the present invention are unobvious over Olson in view of Muir, Ney, and Hayashi.

In view of the remarks above, the Applicant believes that the present invention meets all of the requirements of patentability, and requests the Examiner to find all claims allowable. If for any reason the Examiner believes that a telephone conference would expedite the prosecution of this application, I can be reached at the telephone number listed below.

The Commissioner is authorized to charge any required fees or credit any overpayment of fees to The Lubrizol Corporation Deposit Account No. 12-2275.

Respectfully submitted,
THE LUBRIZOL CORPORATION

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